1. INTRODUCTION:-

Due to industrialization, urbanization, agricultural intensification, deforestation, geometrical population growth various types of pollution is developed in the biosphere, environmental solid waste is the reason for death of about 14,000 peoples in either and towns **(Upadhyay *et. al.* 2013, Goswami *et. al.* 2008).**

The pollutants of industries may destroy the biodiversity of soil. The soil get contaminated due to discharge after treatment or directly released in the soil. The cause of soil pollution is by either alternation in soil environment or due to xenobiotic **(Shivakumar *et. al.* 2012).**

Soil micro flora includes bacteria, fungi, algae and protozoan has threatened for their survival due to effluents released from sugar mill or fertilizer industries **(Kaur *et. al.* 2010).**Contamination of soil may occur due to release of hydrocarbons, pesticides and other metals in the soil which reduces plant metabolism and crop yield.

Thus present project is taken into consideration to study of industrial soil and its ecophysiological effect on the plants of Bhilai industrial area.

2. BRIEF REVIEW OF THE WORK ALREADY DONE IN THE FIELD OF PROPOSED WORK:-

Industrial waste of Korba city of Chhattisgarh state discharged directly into surface water, give significant deterioration its water quality, pH, total hardness, alkalinity, TDS, turbidity, sulphate, chloride, fluoride. WHO and ICMR limit shows about its alternation for health hazard of human uses **(Upadhyay *et. al*. 2013).** The effluents were analyzed for their physico chemical analysis obtained from Amine manufacturing factory and was compared with hug and bore well for pre monsoon and post monsoon seasons **(Somwanshi *et. al.* 2008).** The phytotoxic effect of crop plants caused by tanning industries effluent by **Sharma *et. al.* 1996.** By treating different concentration of pulp and paper mill effluents, the seed germination and seedling growth of mustard, pea and rice shows significant result **(Medhi *et. al.* 2008).**

Industrial effluents and their effect on growth yield and chemical composition of various crops were studied by **Tripathi 1978, Somashekar *et. al.* 1992, Juwarkar**

***et. al.*1993, Saini *et. al.* 1993.** Sugar factory effluent (spentwash) and well water irrigation from adjoining areas were studied in Wardha district of Maharashtra **(Roy *et. al.* 2007).** In Madhya Pradesh in Indore four soil profiles have been exposed in municipal, industrial effluents and municipal waste mixed with industrial wastes and tube well irrigated area. The soil sample were collected horizon wise and they were analyses for pH, electric conductivity, organic carbon, $CaCO_3$, clay content, CEC (cation exchange capacity), ESP (exchangeable sodium percentage) of heavy metals content. It was noticed that heavy metal content decreases due to increasedeftness of soil profile **(Sharma *et. al.* 2007). Arrindum (1999)** evaluate the nutrient absorbing potential in *Sagittaria sagittifolia* by growing them on soil polluted by sugar mill effluents. For acidification of red soil and on the growth and nutrient uptake by wheat effect of calcium carbonate and sodium silicate were studied. Tree reacts very abruptly to the changed growing conditions caused by different factors **(Oszianyi 1999).**

Beside various pollutants the suspended dust in the air and their settings on the surface of leaf and other parts of the plants may affect metabolic activity as phytotoxicant. It also appears deleterious **(Brandt *et. al.* 1972). Pignata *et. al.* (1999)** studied *Melia azadirachta* in relation to atmospheric pollutant in Argentina. The protective role of exogenous polyamines plants specks and oxidative stress in rain treated plants were studied by **Velikova *et. al.* (2000). Zhang *et. al.* (1999)** describes the natural background and anthropogenic pollution.General metabolic activities like photosynthesis, respiration, stomatal regulation etc may interfered by air pollutants **(Miles *et. al.* 1972, Miller *et. al.* 1973).** From lime waste due to pollution stress, there was decrease in chlorophyll and protein content in the species of *Ficus benghalensis***(Lee *et. al.* 1976).**

Various efforts are being undertaken to control serious environmental pollution threat since last decade. Among most polluting 17 industries, cement industry is one of them. The Jaypee Rewa cement industry is a major source of particulate matters SO_X, NO_X and CO_2 emission. This cement dust also contain heavy metals like Nickel, Cobalt, Lead, Chromium, pollutants hazardous to the biotic environment, with impact on vegetation, human and animal health ecosystem **(Baby, *et. al.* 2008).**

Anatomical and physiological aspects of cement dust eliminating from cement factory were studied on woody dicot plants like *Mangifera indica, Psidium guagava,*

Citrus medica, Jasminium grandiflorum, Ipomea carnea, Cannabis sativa, Ligustrum lucidum and *Malva sylvestris***(Shah *et. al.* 1989). Westhoff (1989)** reported that due to decrease of superficially rooting annuals upper soil layers shows acid precipitation due to base cation leaching.Monthly changes in physicochemical parameters like temperature, transparency turbidity, total dissolved solids, pH etc was studied and reported about the pollution of Chargarh dam pollution **(Makode *et. al.* 2012).** Result indicated the inversely proposlinal relation between distance and source of dust emission and its deposition. Chlorophyll content loss of leaf also shows chlorotic and necrotic zone in polluted areas, there is decrease in 35.14 % fruit yield **(Prakash *et. al.* 2003, Murugesan *et. al.* 2004).**

From Ariyalur (Tamilnadu) six lakes were considered for study on into cement factories at around, from Neem (*Azadirachta indica*). Total chlorophyll Chl-a, Chl-b and moisture content were measured by removing dust by water sprinkled **(Ramanathan *et. al.* 2006). Prakash *et. al.* (2003)** studied *Calotropis procera* for cement dust pollution in Maihar cement plant, (MP).It was suggested about recycling of water like fly ash and red mud by industries, user's concerned state and central government department through legislation and strict enforcement may provide better quality of life **(Lahiry, S. C. 1996).**

A case was studied for exposure of its determinants among construction works and it was compared with workers in cement and concrete production by analysis of inhalable dust concentrations. It shows significant result. Highest concentrations were measured in cement production particularly during cleaning tanks where worker wears personal protective equipment. Within job groups temporal variability in exposure concentrations were noticed, 'Using of broom', 'Outdoor wind speed' and presence of rain were overall the most influential factors attaching inhalable cement dust exposure **(Peter *et.al.* 2009).**

3. OBJECTIVES:-

a) Physiochemical analysis of industrial soil.

b) Ecological study of industrial plants – Frequency, relative frequency, Density, relative Density, Abundance, relative Abundance, Important Value Index, relative Important Value Index, Plant cover, relative Plant cover.

c) Phytosociological survey of plants.

d) Isolation of seed from different sites of industrial area.

e) Study of seed germination and effect of different locality site.

f) Study of plant growth = r/p and p/r ratio, (p = plumule, r =radicle).

g) Chemical analysis of industrial plants- Amino acids, Carbohydrates, Chlorophylls (Qualitative and Quantitative analysis).

4. NOTEWORTHY CONTRIBUTIONS IN THE RELATED FIELD OF PROPOSED WORK:-

The waste water generated from the treated pulp and paper mill waste water of paper mill of sirpur kaghajnagar (Andhra Pradesh) from its various sections was collected and treated in the aerated lagoon before using it for irrigation by using field lysimeter study **(Thawale *et. al.* 1999).**

A field study was conducted on two thermal power plants of India to quantify the changes in foliar elemental concentration low rainfall tropical areas **(Agrawal *et. al.* 2000).** It was reported that sulphur dioxide and particulate content were at high level causeserious ecological effects. The effect of stone crushing industries on different foliar parameters of *Shorea robusta* and *Madhuca indica* was studied at Lalpahari forest **(Dulal *et. al.* 2011).** It shows various types of foliar anomalies at microscopic and macroscopic level. There is a decrease in chlorophyll content, total carbohydrate and protein content, it also shows lower rate of photosynthesis and protein synthesis.

Pollution control works has been already carried out in our newly formed State Chhattisgarh by several workers viz. ground water was assessed for water quality **(Chelak *et. al.* 2011).** Physiochemical characterization of urban pond water of Dongargarh was made **(Chelak *et. al.* 2011).** The biotic stress of two pond water of Dongargarh was also study by **Chelak *et. al.* (2012).** The tribal area of Bodla and Pandaria block of district of Kabirdham of Chhattisgarh for analysis of Arsenic and Fluoride of water was also studied **(Verma *et. al.* 2010).** The human activity zone of ground water of Dongargarh city was characterize **(Chelak *et. al.* 2010).** The positive

role of distillery effluent and its phyto-toxic effect on rice in different concentration was studied by **Shrivastava *et. al.* (2007).**

5. PROPOSED METHODOLOGY:-

a) **Description of Area:-**Bhilai is situated in the 21′13 °N and 81′26° E. Bhilai is the city in the Durg district of Chhattisgarh, India. The city located in 25 KM west of the capital Raipur on the main Howrah – Mumbai rail line and National highway 6. Bhilai is famous for BHILAI STEEL PLANT (BSP), which is the largest of steel plant of India and known for being the only manufacture of rails in the country used by Indian railways. Bhilai steel plant along with several small scale industries like power, chemicals, food, fiber, plastic etc are running to give required things to the factory as well as to local inhabitants.

b) **Phytosociological survey: -** Cover relative cover, Frequency, relative frequency, Density, relative Density, Abundance, relative Abundance, Important Value Index (IVI) and relative Important Value Index of each important species will be calculated by standard methods (Quadrate method). The important quantitative analysis such as density, frequency, and abundance of tree species, shrubs and herbs species were determined as per **Curtis and Mclntosh (1950).** Density and relative dominance are summed up together and this value is designated as the Importance Value Index or IVI of the species **(Curtis, 1959).**

c) **Soil Analysis:-**Soil from different locality of factory will be collected from 0-30 cm depth including Science College Raipur campus from its botanical garden. The soil sample was stored in labeled polythene bags and brought to the laboratory. The soil will be air dried, lightly crushed and passed through 2 mm sieve and left for analysis.

For mechanical analysis – coarse texture (by sieving method), water holding capacity (WHC) (by porous pot method), soil organic matters (by potentiometer method), total soluble salt (by titration method), pH (pH electrode method, Dedicated pH meter following **APHA** 21st edition method) etc. should be employed.

d) **Seed germination and plant growth: -** Healthy uniform seeds obtained from different seed centers/field should be used for seed germination. Replica and equal

seeds should be maintioned for each type of seeds and irrigated regularly by providing same light / shade. Final germination percentage should be noted.

e) **Seed germination and plant growth in soil extract: -** The sterilized seeds after seed germination r/p and p/r ratio should be mention in different soil treatment.

f) **Effect of different soil composition on plant growth:-**Different soil of garden and factory should be mixed for growth study.

g) **Chemical analysis of industrial plant: -** For chemical analysis of Industrial plants we should analyze -Amino acids (by thin layer electrophoresis or ninhydrin method), carbohydrates (by anthrone and colorimeter method), chlorophylls (by spectrophotometer method) estimations etc.

6. EXPECTED OUTCOME OF THE PROPOSED WORK:-

a) It will help to analysis the soil quality and its effect on plants.
b) Study of seed germination on soil composition may provide a phytoremediation effect to the society.
c) The rate of pollution will decide that up to what extent the pollution should be allowed in these area.
d) Biodiversity of industrial area should also be prepared with respect to pollution.
e) Ecological study also measures the different other parameters in the industrial area.

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